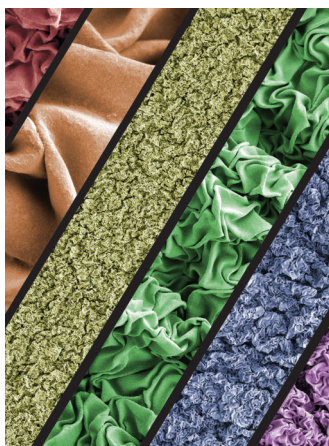


ADVANCED FUNCTIONAL MATERIALS

www.afm-journal.de

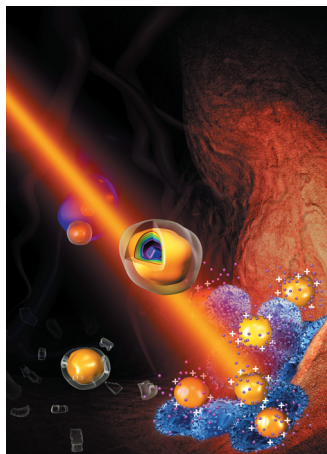


Electrodes

Hierarchically structured materials hold great potential in biosensing, energy storage, photo-voltaics, and tissue engineering. On page 3030, Leyla Soleymani, Jose M. Moran-Mirabal, and co-workers present a rapid, facile, and inexpensive approach to fabricate electrodes with hierarchical features spanning from the millimeter to the nanometer scale. The image depicts the tunable topographies obtained using this method through the stress-driven crumpling of gold films.

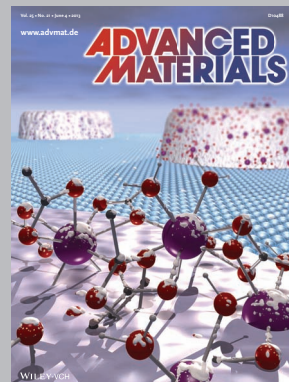
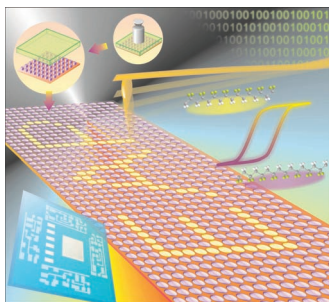
Biomedical Applications

Smart charge-reversible upconversion nanoparticles are reported on page 3077 by Zhuang Liu and co-workers for pH-responsive, in vivo, near-infrared light excited photodynamic therapy. While stable under normal physiological pH, highly sensitive acid-induced charge conversion of the nanoparticles is observed in a slightly acidic tumor microenvironment, resulting in significantly enhanced cellular internalization of nanoparticles and remarkably improved photodynamic cancer cell killing in vitro and in vivo.



Ferroelectric Materials

Ferroelectric polymer free-standing nanodot arrays with ultrahigh data storage density are reported by Qun-Dong Shen and co-workers on page 3124. The arrays are fabricated using nano-imprinting and the preferred orientation of the copolymer chains is favorable for polarization switching of single nanodots. Nanometer electronic features can be written directly in two dimensions using piezoresponse force microscopy probe based technology.



Advanced Materials has been bringing you the best in materials research for over twenty years.

With its increased ISI Impact Factor of 13.877, *Advanced Materials* is one of the most influential journals in the field. Publishing every week, *Advanced Materials* now brings you even more of the latest results at the cutting edge of materials science.

www.advmat.de



Small is the very best interdisciplinary forum for all experimental and theoretical aspects of fundamental and applied research at the micro and nano length scales.

With an ISI impact Factor of 8.349 and publishing every two weeks in 2013 with papers online in advance of print, *Small* is your first-choice venue for top-quality communications, detailed full papers, cutting-edge concepts, and in-depth reviews of all things micro and nano.

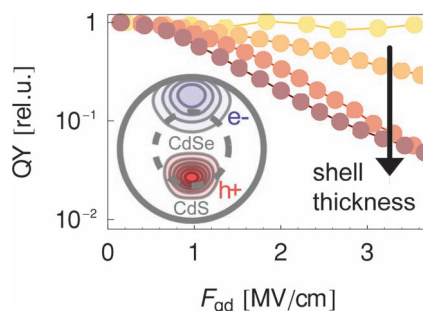
www.small-journal.com

FULL PAPERS

Luminescence

D. Bozyigit, O. Yarema,
V. Wood* 3024–3029

Origins of Low Quantum Efficiencies in Quantum Dot LEDs

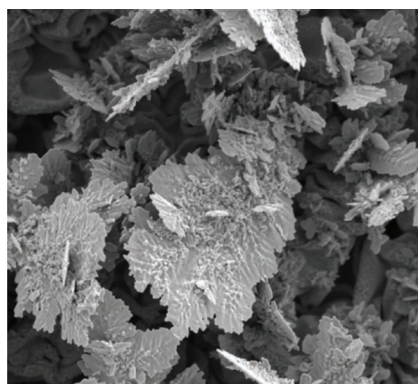


The quantum yield (QY) of CdSe/CdS core/shell colloidal quantum dots (QD) is reduced exponentially with increasing electric field (F_{qd}). This reduction is more pronounced with thicker shells and is due to the reduced overlap between electron and hole wavefunctions. This has strong implications for the use of QDs in opto-electronic applications, where electric field strengths can readily exceed 1 MV cm^{-1} .

Electrochemistry

C. M. Gabardo, Y. Zhu, L. Soleymani,*
J. M. Moran-Mirabal* 3030–3039

Bench-Top Fabrication of Hierarchically Structured High-Surface-Area Electrodes

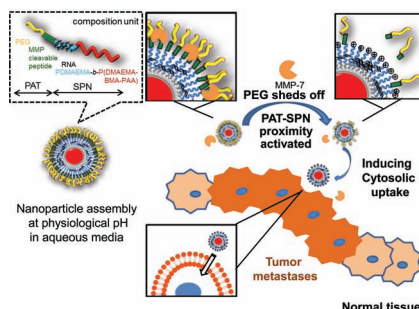


A rapid, facile, and inexpensive method to fabricate hierarchically structured gold electrodes that present high surface areas is presented. The combination of vinyl film masking, stress-driven wrinkling, and electrodeposition allows the rapid prototyping of electrode designs. The fabricated electrodes are robust, highly reproducible, perform well in electrochemical measurements, and demonstrate up to 1000% enhancements in electroactive surface area.

Biomedical Applications

H. Li, S. S. Yu, M. Miteva,
C. E. Nelson, T. Werfel, T. D. Giorgio,*
C. L. Duvall* 3040–3052

Matrix Metalloproteinase Responsive, Proximity-Activated Polymeric Nanoparticles for siRNA Delivery

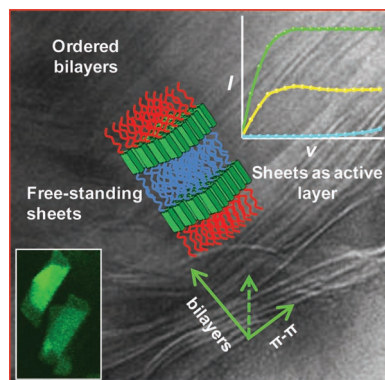


A pH-responsive, smart polymeric nanoparticle (SPN) with matrix metalloproteinase (MMP)-7-dependent proximity-activated targeting (PAT) incorporates polyethylene glycol (PEG) shielding that is removable in MMP-7-rich environments (e.g., breast cancer metastases). The up-regulated MMP-7 activity in pathological tissue exposes the cationic component of the SPN polymer, triggering cell uptake. Following internalization of polymers into the endosomal pathway, pH-dependent endosomal escape facilitates cytosolic siRNA delivery.

Self-Assembly

B. Narayan, S. P. Senanayak,
A. Jain, K. S. Narayan,*
S. J. George* 3053–3060

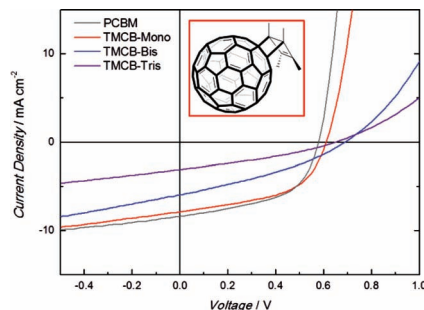
Self-Assembly of π -Conjugated Amphiphiles: Free Standing, Ordered Sheets with Enhanced Mobility



An amphiphilic design and solution-state self-assembly of π -conjugated systems results in free-standing, nanostructured sheets with green fluorescence. Highly ordered, lamellar molecular organization in the sheets leads to good mobility when transferred on to a field-effect transistor device.

FULL PAPERS

Cofacial π -orbital interactions between the fullerene and the cyclobutene addend are shown to decrease the electron affinity and thereby increase the lowest unoccupied molecular orbital (LUMO) energy level of C_{60} significantly. The increased LUMO level of fullerene can be used to generate higher open-circuit voltages and a comparable power conversion efficiency relative to the widely used P3HT/PCBM composite.

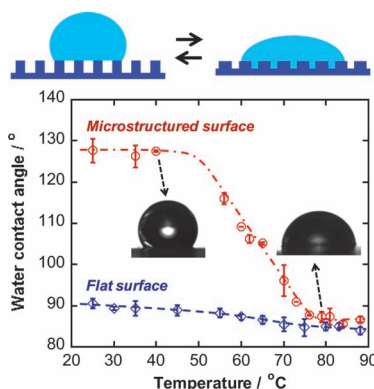


Organic Photovoltaics

G. D. Han, W. R. Collins, T. L. Andrew, V. Bulović, T. M. Swager*3061–3069

Cyclobutadiene- C_{60} Adducts: N-Type Materials for Organic Photovoltaic Cells with High V_{OC}

Microstructured liquid crystalline elastomer surfaces covered with micropillar arrays are developed using a replica molding technique. When modulating the temperature, the contraction of the pillars along their long axis induces a roughness change and therefore a change of the wetting properties of the microstructured surfaces.

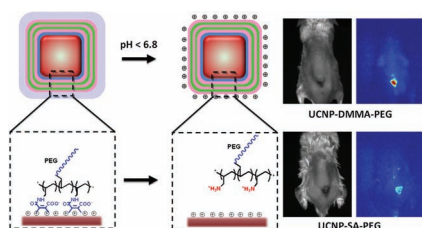


Elastomers

Z. L. Wu, A. Buguin, H. Yang, J.-M. Taulemesse, N. L. Moigne, A. Bergeret, X. Wang, P. Keller*3070–3076

Microstructured Nematic Liquid Crystalline Elastomer Surfaces with Switchable Wetting Properties

Smart charge-reversible upconversion nanoparticles are developed for pH-responsive in vivo near-infrared light-excited photodynamic therapy. While stable under normal physiological pH, highly sensitive acid-induced charge conversion of those nanoparticles is observed in slightly acidic tumor microenvironments, resulting in significantly enhanced cellular internalization of nanoparticles and remarkably improved photodynamic cancer-cell killing efficacy.

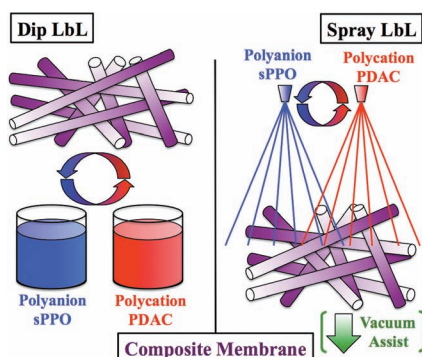


Nanoparticles

C. Wang, L. Cheng, Y. Liu, X. Wang, X. Ma, Z. Deng, Y. Li, Z. Liu*3077–3086

Imaging-Guided pH-Sensitive Photodynamic Therapy Using Charge Reversible Upconversion Nanoparticles under Near-Infrared Light

Polymer electrolyte films are deposited onto highly porous electrospun mats using layer-by-layer (LbL) processing to fabricate composite proton conducting membranes. Various dip and spray processing techniques are investigated for different and unique composite film morphologies. By combining the different spray-LbL fabrication techniques with electrospun fiber supports and tuning the parameters, mechanically stable membranes with high selectivity can be produced.



Composite Materials

D. S. Liu, J. N. Ashcraft, M. M. Mannarino, M. N. Silberstein, A. A. Argun, G. C. Rutledge, M. C. Boyce, P. T. Hammond*3087–3095

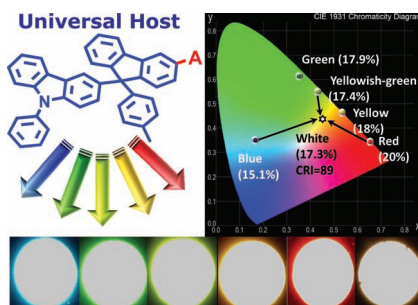
Spray Layer-by-Layer Electrospun Composite Proton Exchange Membranes

FULL PAPERS

Organic Light Emitting Devices

E. Mondal, W.-Y. Hung,* H.-C. Dai,
K.-T. Wong*3096–3105

**Fluorene-Based Asymmetric Bipolar
Universal Hosts for White Organic
Light Emitting Devices**

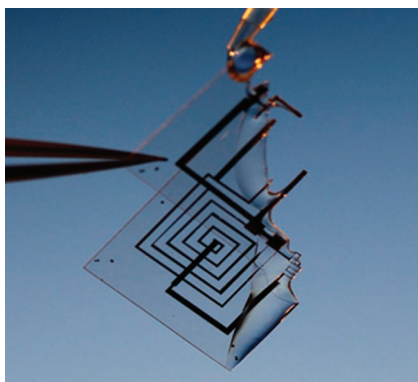


A new bipolar host molecule (CzFCN) configuring hole-transporting carbazole and electron-transporting cyano-substituted fluorene via a saturated carbon center is utilized to realize highly efficient electrophosphorescent blue, green, yellowish-green, yellow, red, and white devices using a common device structure.

Transient Electronics

R. Li, H. Cheng, Y. Su, S.-W. Hwang,
L. Yin, H. Tao, M. A. Brenckle,
D.-H. Kim, F. G. Omenetto,
J. A. Rogers,* Y. Huang*3106–3114

**An Analytical Model of Reactive
Diffusion for Transient Electronics**



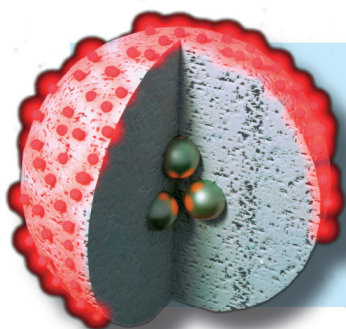
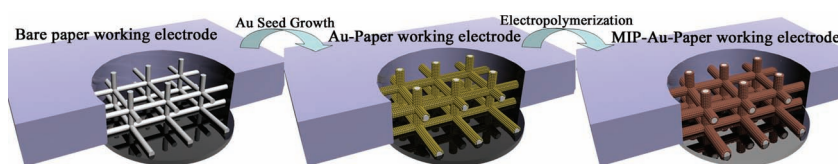
Transient electronics are designed to be **stable and fully functional during their lifetimes**, but then completely disappear in water or biofluids at prescribed rates and at programmed times. Analytical models are established for the dissolution of constituent materials in transient electronic systems, and they provide important design tools for transient electronics.

Molecular Imprinting

L. Ge, S. Wang, J. Yu,* N. Li, S. Ge,
M. Yan3115–3123

**Molecularly Imprinted Polymer Grafted
Porous Au-Paper Electrode for an
Microfluidic Electro-Analytical Origami
Device**

A **molecular imprinting technique** is introduced into a lab-on-paper device through electropolymerization of molecularly imprinted polymer in a novel Au nanoparticle (AuNP) modified paper working electrode. This is fabricated through the growth of AuNP layers on the surfaces of cellulose fibers to enhance the conductivity of the cellulose fibers in the paper and, as a result, increase the effective surface area of the electrode.



How to contact us:

Editorial Office:

Phone: (+49) 6201-606-286/531
Fax: (+49) 6201-606-500
Email: afm@wiley-vch.de

Reprints:

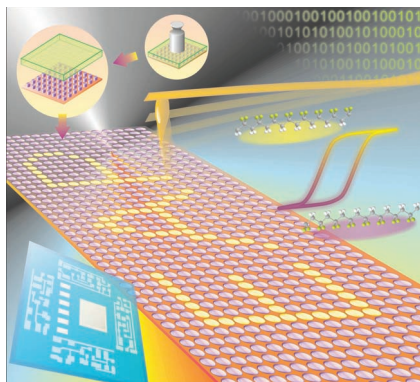
cherth@wiley-vch.de

Copyright Permission:

Fax: (+49) 6201-606-332
Email: rights@wiley-vch.de

FULL PAPER

Ferroelectric polymer [P(VDF-TrFE)] free-standing nanodot arrays with ultra-high data storage density are fabricated through nano-imprinting. The preferred orientation of the copolymer chains in the nanodot arrays is favorable for polarization switching of single nanodots. This approach allows nanometer electronic features to be written directly in two dimensions by piezoresponse force microscopy probe based technology.



Ferroelectric Materials

X.-Z. Chen, Q. Li, X. Chen,
X. Guo, H.-X. Ge, Y. Liu,
Q.-D. Shen*3124–3129

**Nano-Imprinted Ferroelectric Polymer
Nanodot Arrays for High Density Data
Storage**